

Remarks

Applicant respectfully requests reconsideration and reexamination. The status of the claims is now as follows:

- Claims 26-28 have been withdrawn;
- Claim 14 has been canceled;
- Claims 1, 2, 19, and 25 have been amended;
- Of the non-withdrawn claims, claims 1 and 19 are independent.

Drawings:

The Examiner has objected to the drawings because Fig. 3 shows only reference numerals, lead lines, and other seemingly random lines. This error was caused by an undetected software defect, wherein Applicants' CAD software failed to print an entire layer of the figure.

Applicants have supplied a complete Fig. 3, which now includes the previously missing layer. Although the content now shown in Fig. 3 was not initially provided, it is described in the specification as filed and can also be seen in the exploded view of Fig. 2. Therefore, no new matter has been added. A revised Fig. 3 is enclosed herewith, along with a separate letter to the Official Draftsperson.

The Examiner has objected to the figures under 37 C.F.R. 1.83(a) for failing to show every feature claimed. In particular, the figures do not show "the lead screw engaging a threaded region of the elongated blade," as recited in claim 14. Although engagement of the lead screw with the elongated blade is consistent with the invention and falls generally within the scope of the claims, the Examiner is correct that the figures do not show this variation. Applicants' have canceled claim 14 to comply with the requirements of 37 C.F.R. 1.83(a). However, this cancellation is without disclaimer as to this variation and without prejudice to Applicants' right to claim this feature explicitly in a subsequent patent application that clearly shows the feature in the figures.

Rejections under 35 U.S.C. § 112:

The Examiner has rejected claims 1-25 under 35 U.S.C. § 112, ¶2, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. In particular, the Examiner has stated that the phrase “in compliance” is not fully understood.

With regard to claims 1 and 19, the Examiner has asked whether the manipulator is intended to have a compliant arrangement for allowing first and second portions recited in these respective claims to rotate relative to one another.

The Examiner’s understanding is correct, and Applicants have amended claims 1 and 19 to more clearly recite this relationship. Claim 1 as amended now recites that “the first and second portions [are] free to rotate with respect to each other in compliance *with forces between the first and second portions* about at least one axis of rotation” [Emphasis added]. Analogously, claim 19 as amended now recites that “the first and second portions of the interface coupling [are] free to rotate with respect to each other in compliance *with forces between the first and second portions of the interface coupling* about at least one axis of rotation [Emphasis added].

The amendments to claims 1 and 19 are believed to address the Examiner’s concerns. Accordingly, Applicants submit that the rejections of claim 1 and 19 under 35 U.S.C. § 112, ¶2, are overcome.

The Examiner has rejected claim 2 under 35 U.S.C. § 112, ¶2, because the term “interference bearing” (sp.) lacks antecedent basis. Applicants have amended claim 2 to recite an “interface coupling,” and therefore have corrected this error.

The Examiner has rejected claim 14 under 35 U.S.C. § 112, ¶2, because the features claimed are not shown in the figures. Applicants respectfully submit that this rejection is improper because the asserted defect is in the figures, whereas 35 U.S.C. § 112, ¶2, does not pertain to figures, but claims. Nevertheless, as described above, Applicants have canceled claim 14, so the issue is moot.

The Examiner has rejected claim 25 under 35 U.S.C. § 112, ¶2, because the “retaining mechanism” lacks antecedent basis. Applicants have amended claim 25 to correct this error by removing the reference to the “retaining mechanism.” Support for claim 25 can be found in Fig. 2 and at the last paragraph of page 7.

Claims 2-13 and claims 15-18 depend from claim 1. Claims 20-25 depend from claim 19. Separate rejections to claims 2 and 25 have been addressed. Therefore, the rejections of claims 2-13, 15-18, and 20-25 under 35 U.S.C. § 112, ¶2, are believed to be overcome.

Rejections under 35 U.S.C. § 102:

The Examiner has rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by Nakajima et al. (U.S. Patent No. 5,642,056, hereinafter, “Nakajima”). Applicants respectfully submit that the rejection of claim 1 is improper and should be withdrawn.

Nakajima discloses a probe apparatus for correcting the tilt of a probe card to allow probe tips to make more reliable electrical contact with pads when testing semiconductor chips. Fig. 9 shows an embodiment of the probe apparatus. As shown, a test head 27 is brought into contact with a “probe apparatus body” (or “prober”) 11, which allows individual probes 23 to make contact with pads on a probe card 22. The probe card 22 is held in place by a card holder 81. If the probe card 22 becomes tilted due to misalignments, probes 23 can make poor electrical contact with the probe card 22. The probe apparatus of Fig. 9 can correct the tilt of the probe card 22 by changing the orientation of the card holder 81.

The card holder 81 hangs from the test head 27 at three locations. See col. 11, lines 25-32. Tilt correction units 91 are hung at two of these locations and a ball hinge mechanism 92 is hung at a third location. The tilt correction units include motor driven screws, which can advance or retract to raise or lower the card holder 81 with respect to the test head 27. See col. 11, lines 33-40. The ball hinge mechanism 92 forms a pivot point. The two tilt correction units 91 can thus be operated to pivot the card holder 81 upon the ball hinge mechanism 92 to flexibly adjust the tilt of the probe card 22.

In contrast with Nakajima, claim 1 as amended is directed to “A manipulator for positioning and orienting a test head.” Fig. 9 does not show a manipulator, but rather an interface between a test head and a prober. In addition, Fig. 10, which shows the same embodiment as Fig. 9, does not show a manipulator. Therefore, Fig. 9 cannot be used as a basis for rejecting claim 1 as amended, because claim 1 as amended is directed to a different type of mechanism from that shown in Fig. 9 of Nakajima.

In forming the rejection of claim 1, the Examiner has stated that structures 27a and 27b correspond to the “elongated blade” of claim 1 as amended. Claim 1 as amended requires that the elongated blade extend “from a region outside the test head into an internal region of the test head.” Nakajima does not show or describe this aspect of claim 1 as amended.

The structure 27a is not described in the specification; however, it appears to be similar to the structure 27b, which the specification describes as a “frame in the test head

27" (Col. 11, lines 34-35). The function of this "frame" appears to be for holding a motor 93a ("The motor 93a is fixed to a frame 27b in the test head 27." *Id.*).

The specification describes the frame 27b as being a "*in* the test head" [Emphasis added]. Also, Fig. 9 labels the structures 27a and 27b as regions within the test head. The frames are not described or shown as extending "from a region outside the test head into an internal region of the test head," as claim 1 as amended requires.

It is true that Fig. 9 shows a pair of L-shaped structures extending from the prober 11 to left and right sides of the test head 27, and that these L-shaped structures appear to butt up against the frames 27a and 27b. But these structures are neither labeled nor described. It is not clear whether they are co-extensive with the frames 27a and 27b or completely separate.

It is clear, however, that the draftsperson of Nakajima took some liberties in presenting Fig. 9. For instance, the specification states that the test head includes two tilt correction units 91 and one ball hinge mechanism 92. For optimal control over tilt correction, these units 91 and 92 should be spaced apart at approximately 120-degrees, as shown in Fig. 4, in connection with the first embodiment, and as shown partially in Fig. 10, which shows the same embodiment as Fig. 9. By examining Fig. 9, however, it is apparent that a tilt correction unit 91 and a ball hinge mechanism 92 are spaced apart by 180-degrees. The fact that Fig. 9 shows these objects this way appears to have been an intentional attempt to distort the drawing to promote illustrative clarity.

To compound the uncertainty, the L-shaped structures are not even shown in Fig. 10. Given the distortion of Fig. 9 and the absence of L-shaped structures from Fig. 10, it is not at all clear where the L-shaped structures are positioned around the circumference of the test head 27. From the perspective of Fig. 9, which is clearly distorted, they could be in front of the units 91 and 92, behind them, or they could intersect with them.

From the appearance in Fig. 9, a guess is that the L-shaped structures are actually feet that the test head 27 uses to stand upon prober 11. If so, there is no immediately apparent functional reason that the feet of the test head 27 should be coextensive with the motor frames 27a and 27b. Common sense would suggest that the feet and frames should be separate, as the feet would be required hold the significant weight of the test head and would thus require heavy reinforcement.

Accordingly, there is no structure clearly shown in Nakajima that extends "from a region outside the test head into an internal region of the test head," as required by claim 1 as amended.

Along a similar vein, the Examiner has stated that Nakajima discloses an “interface coupling” (92, 93) having a first portion “formed integrally with the elongated blade” and “a second portion (84a) coupled to the test head.” Given the lack of information about the L-shaped structures and the lack of consistent representation of these structures in Figs. 9 and 10, there is no reliable way to know whether the structures 92 and 93 are integral with any parts of the L-shaped structures or are separate.

It is at best highly speculative and therefore improper to conclude that the L-shaped structures are coextensive with the motor frames 27a and 27b or that they are integral with any parts of the units 91 and 92. Therefore, for at least the reasons stated above, Nakajima does not include all the elements of claim 1 as amended. Therefore, the rejection of claim 1 as amended under 35 U.S.C. § 102(a) should be withdrawn.

All rejections of claim 1 as amended have been addressed. Therefore, Applicants respectfully submit that claim 1 as amended is allowable.

Claims 2 – 13 and 15 – 18 depend from claim 1 and are allowable for the same reasons.

All rejections applied to claims 19-25 have been addressed. Therefore, claims 19-25 are also allowable.

Conclusion:

Applicant contends that the application is now in condition for allowance. A notice to that effect is earnestly solicited.

Respectfully Submitted,



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FIG. 3

